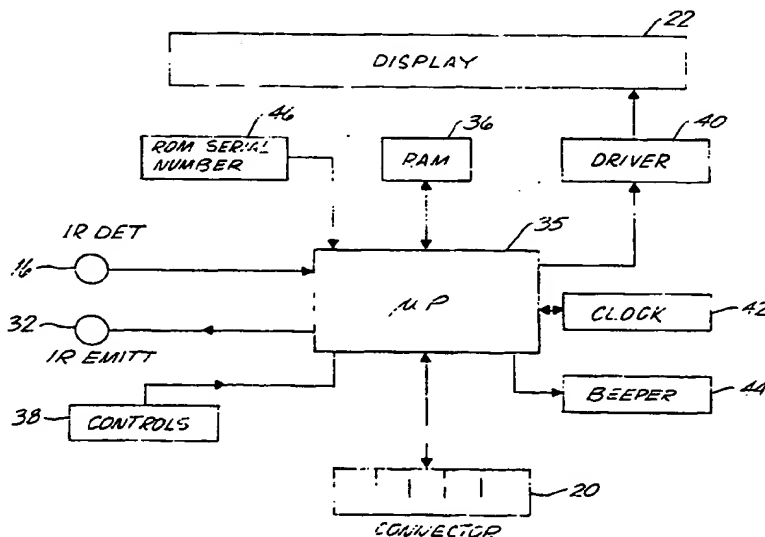




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>5</sup> : <b>H04N 7/087, 7/16</b>		<b>A1</b>	(11) International Publication Number: <b>WO 94/24820</b>
			(43) International Publication Date: <b>27 October 1994 (27.10.94)</b>
(21) International Application Number: <b>PCT/US94/03891</b>		(81) Designated States: AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KP, KR, KZ, LK, LU, LV, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, TT, UA, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: <b>8 April 1994 (08.04.94)</b>			
(30) Priority Data: 08/048,761      16 April 1993 (16.04.93)      US			
(71)(72) Applicants and Inventors: <b>MANKOVITZ, Roy, J. [US/US]; 18057 Medley Drive, Encino, CA 91316 (US). YUEN, Henry, C. [US/US]; P.O. Box 1159, Redondo Beach, CA 90278 (US).</b>		<b>Published</b> <i>With international search report.</i>	
(74) Agent: <b>FISCHER, Felix, L.; Christie, Parker &amp; Hale, 5th floor, 350 W. Colorado Boulevard, P.O. Box 7068, Pasadena, CA 91105 (US).</b>			

(54) Title: PORTABLE ELECTRONIC DATA COUPON



## (57) Abstract

Decoding of data included in the vertical blanking interval of a television transmission signal and storage of the decoded data on a portable data coupon allows unavailable ease of use of commercial discounts, manufactures coupons, and other cost saving devices. The portable data coupon incorporates a receiver (16) for retransmitted encoded data and a storage device (36) for the received data. A display (22) for viewing the data is present in the storage device and a transmitting device (32) is incorporated for selectively transmitting portions of the encoded data for use such as in redeeming a coupon or discount. Selection of data received in the coupon from the VBI to be saved in storage for later redemption is accomplished through interactive input by the user and automatic timing for expiration of data and deletion of data upon redemption are also provided.

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

-1-

## PORTABLE ELECTRONIC DATA COUPON

### Background of the Invention

#### **Field of the Invention**

The present invention relates generally to storage of data provided as a nonprogram portion of television transmission signals. In particular, the invention provides a system for decoding data included in the vertical blanking interval of a television transmission signal and a portable data coupon for storage of selected information from the data received by the system for future use.

#### **Prior Art**

Television broadcast signals provide significant windows in the signal for insertion of data in addition to the required program signals for video and audio reception. The vertical blanking interval (VBI) of the television transmission signal has been employed in the past for data to provide closed captioning for the hearing impaired.

Decoders for data provided in the VBI are well known in the art and standards are being developed for data formats to usefully employ the VBI for transmission of additional data. Typical uses of VBI data to date have been similar to closed captioning wherein data received in the VBI is decoded and provided as a separate video signal for printing of information to the television screen for viewing by the user. Capability of prior art systems to decode, store and usefully employ data which can be provided in the VBI has been extremely limited.

Exemplary of data which may be provided in the VBI are channel specific program information such as short term upcoming program schedules and program related information such as statistics of baseball players during a baseball game, recipes provided during a cooking lesson, problem assignments and answers after an educational program and other related information displayed on the screen relevant

-2-

1 to the program being viewed. The majority of this type of information may be  
displayed or is desirable to be displayed concurrently with existing video  
programming. Consequently, systems for decoding and presentation of the desired  
5 information rely on essentially identical technology to the closed caption systems  
previously described.

Significant additional information may be disseminated through the use of  
VBI signaling, however, practical systems for storage and use of the data to be  
provided are not presently available. Commercial information such as supplemental  
10 telephone number information, identification of local dealers and supplemental  
product/price information in addition to the video and audio presentation of a  
common television commercial are desirable. For greatest benefit this information  
should be available subsequent to the presentation of the video/audio commercial  
and should be stored for subsequent access and/or use. Merely overwriting the  
15 existing video of a commercial with additional information presented in the VBI  
produces no more favorable result for the advertiser than the materials in the  
commercial itself. Such information conveyed on video is fleeting and most  
viewers are not disposed to take any action while actually viewing a commercial.  
Transmission of data on the VBI which can be captured and displayed subsequently  
20 on the screen at the command of the user extends the usefulness of the real time  
broadcast adding "virtual time" in which potential customers may review important  
sales related information at their leisure.

As a portion of the concept of providing commercial information, discount  
information for sales or services may be provided. At the present time discounts  
are typically provided in the form of coupons distributed to consumers in print form  
25 such as newspapers, magazines, store dispensers and so on. The coupon is  
removed from its source by the consumer and brought to the store for redemption.  
Most coupons presently employ a UPC code number in the form of a bar code to  
allow easy confirmation of product, discount value, expiration date and other  
information for comparison with the goods actually purchased by the consumer to  
30 avoid coupon fraud.

The availability of the transmission medium for "coupon" information in the  
VBI of television transmission signals opens a new channel for both the advertiser  
and consumer in the field of commercial communications. The present invention  
provides a method and system whereby such commercial information may be  
35 obtained, stored and used conveniently to obtain the greatest benefit from the  
presentation medium.

### Summary of the Invention

The present invention provides an apparatus for receiving, storing and using commercial or other data provided by transmission during the VBI of a television broadcast signal. A controller which is connected to receive television transmission signals incorporates a VBI decoder for extracting encoded data from the vertical blanking interval of the television transmission signal. A retransmitting device is provided by the controller for sending the VBI data which is received to a portable data coupon. The portable data coupon incorporates a receiver for the retransmitted encoded data and a storage device for the received data. The data coupon includes a display for displaying data present in the storage device which is routed through an internal decoder to provide an alphanumeric read out. The coupon further includes a transmitting device for selectively transmitting portions of the encoded data to a receiving apparatus for use.

A memory included in the controller provides additional flexibility for receiving the encoded data from the VBI decoder and subsequently transmitting the data to the portable data coupon. A multiplexer in the controller determines selection of memory storage or immediate retransmission.

A memory equipped controller also includes a receiver which is employed to receive data transmitted by the portable data coupon for storage in the controller memory. In this embodiment the controller acts as the receiving apparatus for the data transmitted from the portable data coupon.

VBI data may provide differing information to the controller which is applicable to multiple uses. The VBI decoder of the controller incorporates the capability for decoding multiple categories of encoded data. A microprocessor or other programmable logic controller segregates the categories of data and a data formatter connected to the retransmission system formats the data corresponding to its category. Additionally, control signals generated by the controller are formatted for segregation from VBI data. The receiver in the portable data coupon discriminates between the formatted data categories to allow storing of only desired data in the portable data coupon or segregation of the data based on data category.

Clocks or other time keeping means are provided in the portable data coupon and the controller for time marking of data and comparison of time marked data with current time and date. Transmitted data may also incorporate time information which is employed for updating of the clocks in the controller and portable data coupon.

Data stored in the portable data coupon is selectively deleted manually or automatically after transmission from the data coupon for an end use. As

1 exemplified by the use of the portable data coupon for merchandise or service discounts, transmission of the stored data relating to the discount equivalent to the redemption of a paper coupon would result in automatic deletion of that data from the memory of the portable data coupon thereby precluding reuse of the discount.

#### 5 Brief Description of the Drawings

The present invention will be more clearly understood with reference to the following drawings and detailed specification:

10 FIG. 1A shows in schematic form the electronic data coupon with display controls and various interface devices in combination with a controller having communications interfaces for the portable data coupon;

FIG. 1B provides a representation of the display of the portable data coupon wherein the display mode shows a UPC bar code format for use with a laser scanner;

15 FIG. 1C is a partial schematic representation of a second embodiment of the portable data coupon employing a alphanumeric key pad for data input;

FIG. 2 is a schematic block diagram of the operational elements of the portable data coupon;

20 FIG. 3 is a schematic block diagram of the controller for the vertical blanking interval data application system;

FIG. 4 is a schematic block diagram for a redemption system for electronic coupons provided as stored data for the portable data coupon; and

FIG. 5 is a pictorial view of the portable data coupon stored in a holder for receiving transmitted data.

25 FIG. 6 is a block diagram schematic of an embodiment of the portable data coupon for storage of a picture image allowing use as an electronic ID card.

#### Detailed Description

30 Referring to FIG. 1A, a portable data coupon 10 is shown to provide practical secondary use of data transmitted in the vertical blanking interval of television transmission signals. VBI data is decoded from the television transmission signal by controller 12 which then transmits the data to the portable electronic coupon. In the embodiment shown in the drawings, two transmission methods are available. An IR emitter 14 which provides a wide band infrared signal which is received by an IR detector 16 on the portable data coupon allows "remote" communication with the portable data coupon. Alternatively, a serial interface may be employed with a first moiety of a connector 18 in the controller

35

-5-

1 receiving a mating second moiety of the connector 20 present on the portable data  
coupon. Transmission of the data employing the IR emitter/detector combination  
allows placement of the portable data coupon at any desired location where the  
broad band infrared radiation from the emitter can be received. The serial interface  
5 requires direct connection of the portable data coupon to the controller unit.

The portable data coupon includes a display 22 on which data received and  
stored in the portable data coupon may be shown to the user. Controls for  
operation of the portable data coupon including a "read" key 24 for calling data to  
the display, a "cancel" key 26 for deleting data, a "save" key 28 for protecting  
10 stored data as will be discussed subsequently, and a "send" key 30 for initiating  
transmission of data stored in the portable data coupon. An IR emitter 32 is  
provided for transmitting data stored in the portable data coupon to a receiving  
apparatus responsive to the "send" key. Alternatively, data may be sent to a  
receiving apparatus using the serial interface previously described for receiving  
15 data.

In the embodiment shown in the drawings the controller also includes an IR  
detector 34 for receiving data transmitted by the portable data coupon in various  
applications to be described in greater detail subsequently.

The structure of the operating components of the portable data coupon are  
20 best seen in FIG. 2. Encoded data transmitted by the controller is received through  
the IR detector or serial port connector and provided to a microprocessor. The  
microprocessor stores the data in a storage device such as a random access memory  
(RAM) 36 for the embodiment shown in the drawings. Data manipulation in the  
portable data coupon is provided by the microprocessor responsive to the controls  
25 previously described which are generally described in FIG. 2 as controls 38. In  
response to the user depressing the read key, the microprocessor will retrieve the  
encoded data from a presently addressed memory location in the RAM and decode  
the data for output through a driver 40 to the display. In the embodiment shown in  
the drawings a Liquid Crystal Display (LCD) is provided with multiple  
30 alphanumeric character capability.

Depressing the cancel key on the portable data coupon causes the  
microprocessor to delete the data in the memory location corresponding to the data  
on the display while depressing the send key will result in transmission of the data  
in the memory location corresponding to the displayed data through the IR emitter  
or serial port connector.  
35

In the embodiment shown in the drawings data received by the portable data  
coupon is placed in a temporary storage buffer of the RAM. This temporary

-6-

1 storage comprises a predetermined number of storage locations addressed by the  
microprocessor. When the temporary storage buffer is full additional data received  
by the portable data coupon will be written into the temporary buffer by the  
microprocessor over writing the oldest data in the buffer. A circular address  
5 pointer system for first in, first out storage in the temporary buffer or similar  
addressing technique is employed by the microprocessor. Data which the user  
desires to retain is written from the temporary storage buffer to a protected buffer  
by depressing the save key on the coupon. In response to the save key the  
microprocessor will protect the data in the temporary storage buffer corresponding  
10 to the data on the display by transferring the data to a protected or permanent  
storage buffer in the RAM or alternatively setting a protect flag on the storage  
location to prevent over-writing of the data.

The portable data coupon incorporates a clock 42 for timekeeping purposes  
to provide current time and date and for time flagging of received data by the  
15 microprocessor during storage. Encoded data received by the portable data coupon  
can include time information decoded by the microprocessor for updating the  
internal clock.

The microprocessor incorporates within the data handling capability a  
sorting function for the data received to allow data of different formats to be  
20 employed by the portable data coupon. Transmitted timekeeping data and data  
received by the clock are exemplary of these data categories. Additional categories  
for various applications of the portable data coupon will be described in greater  
detail subsequently.

For certain applications data received by the portable data coupon will  
25 incorporate "prompt" information to identify to the user the desirability of  
transferring received data from the temporary storage buffer to protected storage.  
A flashing character presentation on the display or an audible signal provided by a  
beeper 44 under the control of the microprocessor are employed as the user prompt.  
The user prompt provides an additional category of data received by the portable  
30 data coupon.

Data stored in the portable data coupon is transferable to a receiving  
apparatus through the IR emitter or the serial port connector. The portable data  
coupon may therefore act as a data transfer device in addition to a data storage  
device. Confirmation of the portable data coupon as the source for data transmitted  
35 to such receiving apparatus is accomplished by a specific serial number or other  
code for the portable data coupon stored in a read only memory (ROM) 46  
accessible by the microprocessor for transmission with the data to the receiving

-7-

1 apparatus. A receiving apparatus including a data transmission system through an  
IR emitter or alternatively in a serial port connection can employ a dialog approach  
with the microprocessor of the portable data coupon for review of data contained  
within the portable data coupon, extraction of appropriate data and confirmation of  
5 the identification of the portable data coupon.

An example of the operation of the portable data coupon in a primary  
anticipated use provides supplemental data storage and "electronic coupons" for  
discounts on merchandise or services offered in television commercials. During the  
vertical blanking intervals of a television commercial, information associated with  
10 the telephone number, address or selection information for local dealers of the  
product or service are transmitted or details of offered discounts including  
identification of merchandise, value of the discount, expiration date and so on. The  
controller decodes the VBI data using standard techniques. The data present in the  
VBI is further encrypted to avoid use by systems other than authorized portable data  
15 coupons. The encoded data stripped from the VBI is retransmitted to the portable  
data coupon where it is stored in temporary memory as previously described. The  
coupon user may then retrieve the information from the memory through the use of  
the read key. Telephone numbers, addresses and similar information are decoded  
by the microprocessor and displayed on the portable data coupon for review by the  
20 user through the use of the read key. Electronic coupon information is displayed in  
one of several formats. An alphanumeric format showing the  
vendor/producer/dealer, amount of discount and expiration date allows the user to  
determine the value of the "electronic coupon." A standard UPC bar code format is  
alternatively presented on the display through predetermined key strokes on the  
25 existing keys or by way of a "shift" key (not shown) for use with redemption  
systems employing a laser scanner or similar system. The UPC bar code system  
allows easy comparison by automatic cash register systems of goods purchased.  
Such a bar code display is shown in FIG. 1B.

At a predetermined time after completion of the television commercial to  
30 allow the user to contemplate the information provided, a prompt command is  
provided in the VBI data which is retransmitted by the controller to the television  
screen or to the portable data coupon. Upon receiving the prompt command the  
microprocessor activates the beeper or flashing display character to call the user's  
attention to the fact that a coupon or other information has been provided. The user  
35 may review the information using the read key and determine if the information  
should be saved in protected storage to preclude over-writing by subsequent  
commercial information. If the save key is pressed, the information is protected

-8-

1 and may then be used subsequently for redeeming the "electronic coupon."  
Alternatively, if the information is of no interest to the user, the cancel key may be  
pressed and the data cancelled at that time.

5 The portable data coupon monitors expiration date information provided in  
the encoded data and the microprocessor compares current time and date  
information provided by the internal clock to the expiration date of information  
present in data storage. Upon reaching a predetermined period prior to an  
expiration date the microprocessor will display the information corresponding to the  
10 approaching expiration date and prompt the user by activating the beeper or flashing  
display cue. Data in protected and temporary storage which contains an expiration  
date is monitored by the microprocessor and upon passing the expiration date the  
memory locations are cleared thereby conserving memory resources.

15 An embodiment of the controller for use with the portable data coupon is  
shown in FIG. 3. The controller may be incorporated in the television itself or  
other product incorporating a VBI decoder and data retransmission system as  
previously described. Incorporation of the controller into a VCR system is  
accomplished in a present embodiment employing a system as disclosed in U.S.  
Patent Application, Serial No. 08/014,541 filed on February 8, 1993, entitled  
"Enhancing Operations of Video Tape Cassette Players" having a common assignee  
20 as the present invention which is incorporated herein in its entirety by reference.

As shown in FIG. 3, the controller receives the television broadcast signal  
on the video input line 48, video is also provided to the tuner of the television set  
(not shown) for normal television viewing. A VBI decoder 50 receives the video  
input signal and decodes the data provided in the vertical blanking interval under the  
25 control of a microprocessor 52. Data formats for VBI data are well known in the  
industry and exemplified by the report entitled "Recommended Practice for Line 21  
Data Services Part 7 Extended Data Service Packets" draft EIA-608.

30 VBI encoder/decoder systems are well known in the art and are presently  
employed for closed captioning for the hearing impaired. Formatting of specific  
data types for recognition by the microprocessor allows the data storage capability  
of the VBI to be employed for multiple uses. Various data provided in the vertical  
blanking interval may include program information for television programs being  
watched or taped. Commercial information, such as that previously described is  
also provided in the VBI data. The VBI decoder incorporates a multiplexer under  
35 the control of the microprocessor which segregates program information data from  
data applicable to the portable data coupon.

1           In a first embodiment of the present system the coupon data stripped from  
the VBI by the VBI decoder is provided directly to a retransmitter in the controller.  
As previously described, this retransmitter may take the form of an IR emitter or a  
standard serial port employing a hard wired connector.

5           In a second embodiment of the system the coupon data is directed from the  
VBI decoder to a memory 54 internal to the controller for storage. This storage  
allows delayed retransmission to the portable data coupon and under the control of  
the microprocessor allows burst transmission of stored data in the memory as  
opposed to real-time intermittent transmission provided by direct VBI decoding.  
10          The memory capability of the controller is far less constrained by physical  
dimensional requirements than the memory of the portable data coupon.  
Consequently, operational scenarios for the system wherein data stripped from the  
VBI is temporary stored in the controller and only downloaded to the portable data  
coupon for use are envisioned.

15          The data extracted from the VBI by the decoder includes program  
information or other data which may not be directly applicable to the portable data  
coupon. Incorporation of the controller system in a VCR, as identified in the  
exemplary referenced embodiment of Patent Application Serial No. 014,541 is  
enhanced by providing capability in the controller for directing VBI data and other  
20          control information to devices in addition to the portable data coupon. As shown in  
FIG. 3 the microprocessor provides direct coded control data, for instance, control  
information for a cable television decoder box, through a code data generator 56.  
A data formatter 58 under control of the microprocessor provides transmission data  
to the infrared emitter in specific formats for data categories. For example, as  
25          shown in FIG. 3 category 1 data is control data output from the code data system  
for control of a secondary apparatus by the microprocessor of the controller.  
Category 2 information is program ID information provided from the controller  
memory while category 3 data is commercial data available for the portable data  
coupon. The controller incorporates a clock 60 for time keeping functions  
30          providing an output through the data formatter under the control of the  
microprocessor as category 4 data.

35          In certain applications the controller may be operable from a remote control  
device as exemplified by a standard VCR remote controller. The IR detector 34 in  
the controller is adapted to receive IR transmissions from such remote controllers  
for processing by the microprocessor. The microprocessor in turn converts such  
remote control inputs to code data for control of alternate devices such as the cable  
box, television or the portable data coupon. Prompting of the portable data coupon

-10-

1 user through the beeper on the coupon during a broadcast of commercial  
information, as previously described, may be responded to by use of the remote  
control wherein a predetermined key-stroke on the remote control provides an  
infrared signal to the controller which is received on the IR detector and provided  
5 by the controller microprocessor as a code data signal through the IR emitter of the  
controller which is in turn received by the IR detector of the portable data coupon  
to accomplish the save function without the user having to retrieve the coupon and  
press the save button on the coupon itself. As previously described, the  
microprocessor 35 in the portable data coupon incorporates data segregation  
10 capability based on the data formats, consequently control data in the code data  
format having a functional representation for the controls of the portable data  
coupon may be received for "hands-off" operation of the portable data coupon  
functions.

15 Use of a remote control for remote activation of control functions for  
multiple portable data coupons is accomplished by including a card identification  
number in the key stroke sequence thereby allowing different "electronic coupons"  
or other data to be saved in separate portable data coupons.

20 In an additional alternate operational mode for the portable data coupon,  
program information data stored in the controller memory for use with other  
controller functions such as, video tape recording, may be downloaded into the  
portable data coupon for transportation to a second controller. Downloading of the  
program information would be accomplished under the control of the controller  
microprocessor through the IR emitter or serial port connection in a data format  
recognized by the portable data coupon. Data received by the portable data coupon  
25 would be stored in temporary or protected storage buffers. Uploading of the data  
from the portable data coupon to the second controller system would then be  
accomplished by employing the send key 30 of FIG. 1a on the portable data coupon  
for transmission of the data through the IR emitter 32 or serial port connector 20 to  
the memory of the second controller.

30 An alternate embodiment of the portable data coupon for use without  
retransmission capability from the controller employs a standard alpha-numeric  
keypad 62 as represented in FIG. 1c. VBI data decoded from commercial  
information incorporates a predetermined numerical code which is provided by the  
controller to the user on the television screen for direct entry into the portable data  
35 coupon using the keypad. For example, an encoded version of a standard UPC  
code may be displayed on the screen which is entered by the user on the keypad and  
decoded by the microprocessor in the portable data coupon resulting in a display of

-11-

1 the vendor/dealer, product discount amount and expiration data. This data would then be available in protected storage of the portable data coupon for later use as previously described.

5 A redemption system for the implementation of the portable data coupon for "electronic coupons" is shown schematically in FIG. 4. A standard bar code scanning cash register system 64 having a scanner 66 is typically employed as a point of sale system. Products sold are scanned by the laser scanner using UPC bar codes and automatically registered in the cash register system with product identification and price. Presently available paper coupons typically employ a UPC  
10 bar code which is scanned by the laser scanner, compared to the purchases made, and if the product has been purchased, the coupon discount is applied to the sales total. The portable data coupon may be employed in the same fashion by calling up the recorded discount in a UPC bar code format as previously described and shown in FIG. 1B. Scanning by the normal laser scanner then allows the cash register  
15 system to confirm purchase of the discounted product and application of the appropriate discount to the sales total.

Paper coupons are typically collected upon redemption to avoid reuse. Store employees manually cancel each coupon after redemption using the cancel key on the portable data coupon. Alternatively, the portable data coupon, through use  
20 of the IR detector 16, automatically deletes a scanned coupon by detection of the laser light signal in the IR detector. To avoid deletion of the "electronic coupon" prior to confirmation that the coupon has been accepted by the cash register system, an identification bit may be set in the storage location, resulting in a time delayed erasure of the coupon which is reversible, if the coupon has not in fact been  
25 redeemed,

by a coded input by store employees on the controls of the portable data coupon.

A supplemental adapter for electronic coupons 68 for use with the portable data coupon provides a positive interactive communication means with a portable data coupon for enhanced reliability of the point of sale system. The portable data  
30 coupon is placed in close proximity to the adapter for infrared signal transmission and reception, allowing a dialog interchange between the adapter and portable data coupon for evaluation and redemption of all "electronic coupons" corresponding to products purchased. The adapter incorporates an infrared emitter 70 and an infrared detector 72 for communication with the portable data coupon. The adapter  
35 queries the portable data coupon by data transmission through the IR emitter 70 which is received by the IR detector 16 on the portable data coupon. Data transmitted by the portable data coupon on IR emitter 32 is received by IR detector

-12-

1 72 in the adapter for processing by the cash register system. Upon confirmation of  
the purchase of the discounted article, a cancellation signal is issued by the adapter  
on the IR emitter 70, confirming redemption of the coupon. The redemption signal  
is received by the IR detector 16 on the portable data coupon and data  
5 corresponding to the discount is cancelled or erased from storage. A mating  
connector moiety 74 is also provided in the adapter for connection to the connector  
moiety 20 on the portable data coupon for communication through the serial  
interface employing query and response for "electronic coupons" present in the  
portable data coupon corresponding to products purchased.

10 Interrogation of the portable data coupon for serial number from the ROM  
as previously described is employed as a security measure to avoid "pirate" portable  
data coupons thereby reducing "coupon fraud."

Returning to the system embodiment of FIG 1a, to promote optimum  
communications with the portable data coupon during remote data transfer from the  
15 controller through broad band infrared transmission, placement of the portable data  
coupon in reasonable proximity to the controller is required. As shown in FIG. 5,  
a stand 76 comprising a channel having upstanding legs to support the portable data  
coupon in an substantially vertical orientation is employed. The embodiment shown  
in the drawings provides a front leg 78 of the channel having a vertical dimension  
20 sized to allow exposure of the IR detector 16 and a second leg 80 having a vertical  
dimension sufficient to support the portable data coupon in a substantially upright  
position. Use of IR transparent materials for alternate embodiments of the stand  
eliminates the requirement for a reduced vertical dimension of the first leg. A  
holder for multiple portable data coupons employing a stepped arrangement between  
25 compartments for individual coupons may be employed to provide optimum  
exposure of the IR detector of each portable data coupon for data reception.

Yet another embodiment for use of the portable data coupon is shown in  
FIG. 6. Photographic images taken by a video camera 82 are transmitted through a  
photo adapter 84 employing an infrared emitter 86 to be received by the portable  
30 data coupon on infrared detector 16. Use of the portable data coupon as an  
electronic identification card is accomplished by requiring entry of a personal  
identification number (PIN) known to the card owner and corresponding to the  
serial number of the card stored in the ROM. Video data received from the photo  
adapter is placed in permanent storage upon proper entry of the PIN. Data transfer  
35 and interface control for the video data is accomplished through the use of an IR  
detector 88 responsive to the IR emitter 32 of the portable data coupon.

-13-

1 In operation, the system allows the user to select poses and replace the  
stored video information as desired. However, the requirement for entry of the  
PIN, prior to protected storage of the image precludes improper entry of  
5 identification photos. Alternatively, the key board for entry of the PIN is  
incorporated in the photo adapter and PIN information is verified by dialog  
communications with the portable data coupon.

Data communication between the photo adapter and portable data coupon is  
accomplished in an alternative embodiment through the use of the connector and  
10 serial port interface as previously described.

10 Having now described the invention in detail as required by the patent  
statutes, those skilled in the art will recognize modifications and substitutions to the  
embodiments disclosed herein. Such modifications and substitutions are  
encompassed within the present invention as defined in the following claims.

15

20

25

30

35

1           **WHAT IS CLAIMED IS:**

5           1.       A portable data coupon comprising:  
              means for receiving encoded data;  
              means for storing the received data;  
              means for selectively decoding and displaying the data present in the  
storing means; and  
              means for selectively transmitting the encoded data to a receiving  
apparatus.

10          2.       A portable data coupon as defined in claim 1 further comprising  
means for confirming a unique identification of the data coupon to the receiving  
apparatus.

15          3.       A portable data coupon as defined in claim 1 further comprising  
means for selectively deleting stored data.

20          4.       A portable data coupon as defined in claim 1 wherein the means for  
storing includes at least one temporary storage location and a plurality of protected  
storage locations, said received data being stored in said at least one temporary  
storage location and further comprising means for selectively transferring data from  
said at least one temporary storage location to one of said protected locations.

25          5.       A portable data coupon as defined in claim 4 further comprising a  
plurality of temporary storage locations and means for addressing said temporary  
storage locations, said addressing means sequentially addressing each temporary  
storage location for storage of received encoded data and, when all temporary  
storage locations are full, addressing the temporary storage location having the  
oldest data for storage of newly received data.

30          6.       A portable data coupon as defined in claim 1 further comprising a  
time keeping means.

35          7.       A portable data coupon as defined in claim 6 further comprising  
means for storing current time and date from the time keeping means with received  
data.

-15-

1           8.     A portable data coupon as defined in claim 6 wherein the encoded  
data includes current time and date information and further comprising means for  
updating said time keeping means to current time and date responsive to the  
encoded data.

5           9.     A portable data coupon as defined in claim 1 wherein the encoded  
data comprises merchandise or service discount information.

10          10.    A portable data coupon as defined in claim 9 wherein said discount  
information includes offerer identification and discount identification.

          11.    A portable data coupon as defined in claim 9 wherein said discount  
information includes an expiration date.

15          12.    A portable data coupon as defined in claim 11 further comprising  
means for comparing the current date from the time keeping means to the date  
included in said discount information and means for deleting said data from the  
storing means when the expiration date exceeds the current date.

20          13.    A portable data coupon as defined in claim 11 further comprising  
indicating means responsive to the comparing means for indicating to a user when  
the current date reaches a predetermined period prior to the expiration date.

25          14.    A portable data coupon as defined in claim 9 wherein the encoded  
data includes identification of offerer, product or service, and discount amount in  
UPC format.

30          15.    A portable data coupon as defined in claim 14 wherein the decoding  
and display means selectively decodes and displays said encoded data in a first alpha  
numeric format and in a second bar code format and said portable data coupon  
further includes means for selection of display format.

35          16.    A portable data coupon as defined in claim 1 wherein the means for  
receiving encoded data comprises an infrared detector.

          17.    A portable data coupon as defined in claim 1 wherein the means for  
receiving encoded data comprises a serial input port.

-16-

1           18.     A portable data coupon as defined in claim 1 wherein the means for receiving encoded data comprises an alpha numeric key pad.

5           19.     A portable data coupon as defined in claim 1 wherein the encoded data comprises a prompt signal and the portable data coupon further comprises means for indicating that a prompt has been received.

10          20.     A portable data coupon as defined in claim 19 wherein the indicator means is a beeper.

        21.     A portable data coupon as defined in claim 19 wherein the indicator means comprises a flashing visual indicator.

15          22.     A vertical blanking interval data application system comprising:  
                a controller connected to receive television signal transmissions including encoded data inserted in the vertical blanking interval of the television signal, said controller having:

20                  a memory for storage of the encoded data received;  
                means for transmitting the encoded data stored in the memory and,  
                a portable data coupon having  
                means for receiving the data transmitted by the controller;  
                means for storing the received data;  
                means for selectively decoding and displaying the data present in the storing means, and  
25                  means for selectively transmitting the encoded data to a receiving apparatus.

30          23.     A vertical blanking interval data application system as described in claim 18 wherein said controller further comprises means for detecting data transmitted by said coupon said detection means connected to the memory for storage of the received coupon data.

35

-17-

- 1                   24.    A vertical blanking interval data application system comprising:  
                  a controller connected to receive television transmission signals and  
                  having  
                  a VBI decoder for extracting encoded data from the vertical  
5                   blanking interval of the television transmission signal and  
                  means for retransmitting said encoded data; and,  
                  a portable data coupon having  
                  means for receiving the retransmitted encoded data,  
                  means for storing the received data,  
10                   means for selectively decoding and displaying the data present in the  
                  storing means, and  
                  means for selectively transmitting the encoded data to a receiving  
                  apparatus.
- 15                   25.    A vertical blanking interval data application system as defined in  
                  claim 24 wherein the controller further comprises:  
                  a memory connected to receive encoded data from the VBI decoder,  
                  and  
                  a multiplexer intermediate the VBI decoder and data retransmission  
20                   means and connected to the memory for selectively providing encoded data from the  
                  VBI decoder in a first state and from the memory in a second state to the data  
                  retransmission means.
26.    A vertical blanking interval data application system as defined in  
25                   claim 25 wherein the controller further includes a means for detecting encoded data  
                  transmitted by the transmitting means of the coupon said detection means connected  
                  to the memory for storing data from the coupon.
27.    A vertical blanking interval data application system as defined in  
30                   claim 25 wherein the VBI decoder includes means for categorizing encoded data  
                  received in the television transmission signal, and said controller further comprises:  
                  logic means for segregating the categories of data; and  
                  a data formatter connected to the retransmission means and  
                  responsive to the logic means for formatting data for retransmission corresponding  
35                   to the category of the data.

-18-

1           28.    A vertical blanking interval data application system as defined in  
claim 27 wherein the multiplexer of the VBI decoder is responsive to the logic  
means for directing data to the memory or the retransmission means based on the  
category of the data.

5           29.    A vertical blanking interval data application system as defined in  
claim 27, further comprising a clock having a time data output and wherein the  
logic means further segregates the time data as a category of data.

10          30.    A vertical blanking interval data application system as defined in  
claim 29, wherein station time data is a category of data received by the VBI  
decoder and further comprising means for resetting the internal clock to equal the  
station time data responsive to a control signal from the logic means.

15          31.    A vertical blanking interval data application system as defined in  
claim 27, wherein the portable data coupon further comprises means for detecting  
data formatted by the data formatter, said detecting means selectively providing an  
enable signal to the storing means to allow storing of received data.

20          32.    A vertical blanking interval data application system as defined in  
claim 27, wherein the controller further comprises means for generating control data  
for operation of a secondary device, said control data segregated by the logic means  
as a category of data and wherein said data formatter formats said control data for  
transmission to the secondary device.

25          33.    A vertical blanking interval data application system as defined in  
claim 25 wherein the portable data coupon further comprises means for confirming  
a unique identification of the data coupon to the receiving apparatus.

30          34.    A vertical blanking interval data application system as defined in  
claim 25 wherein the portable data coupon further comprises means for selectively  
deleting stored data.

35

-19-

1           35.    A vertical blanking interval data application system as defined in  
claim 25 wherein the means for storing in the portable data coupon includes at least  
one temporary storage location and a plurality of protected storage locations, said  
received data being stored in said at least one temporary storage location and further  
5           comprising means for selectively transferring data from said at least one temporary  
storage location to one of said protected locations.

10           36.    A vertical blanking interval data application system as defined in  
claim 35 wherein the portable data coupon further comprises a plurality of  
temporary storage locations and means for addressing said temporary storage  
locations, said addressing means sequentially addressing each temporary storage  
location for storage of received encoded data and, when all temporary storage  
locations are full, addressing the temporary storage location having the oldest data  
for storage of newly received data.

15           37.    A vertical blanking interval data application system as defined in  
claim 25 wherein the portable data coupon further comprises a time keeping means.

20           38.    A vertical blanking interval data application system as defined in  
claim 37 wherein the portable data coupon further comprises means for storing  
current time and date from the time keeping means with received data.

25           39.    A vertical blanking interval data application system as defined in  
claim 37 wherein the encoded data includes current time and date information and  
wherein the portable data coupon further comprises means for updating said time  
keeping means to current time and date responsive to the encoded data.

30           40.    A vertical blanking interval data application system as defined in  
claim 25 wherein the encoded data comprises merchandise or service discount  
information.

35           41.    A vertical blanking interval data application system as defined in  
claim 40 wherein said discount information includes offeror identification and  
discount identification.

42.    A vertical blanking interval data application system as defined in  
claim 40 wherein said discount information includes an expiration date.

-20-

1           43.    A vertical blanking interval data application system as defined in  
claim 42 wherein the portable data coupon further comprises means for comparing  
the current date from the time keeping means to the date included in said discount  
information and means for deleting said data from the storing means when the  
5           expiration date exceeds the current date.

          44.    A vertical blanking interval data application system as defined in  
claim 40 wherein the encoded data includes identification of offeror product or  
service and discount amount in UPC format.

10           45.    A vertical blanking interval data application system as defined in  
claim 25 wherein the decoding and display means of the portable data coupon  
selectively decodes and displays said encoded data in a first alphanumeric format  
and in a second bar code format and said portable data coupon further includes  
15           means for selection of display format.

          46.    A vertical blanking interval data application system as defined in  
claim 25 wherein the retransmitting means comprises an infrared emitter and  
wherein the means for receiving the retransmitted encoded data comprises an  
20           infrared detector.

          47.    A vertical blanking interval data application system as defined in  
claim 25 wherein the means for retransmitting comprises a serial output port and  
wherein the means for receiving the retransmitted encoded data comprises a serial  
25           input port.

          48.    A vertical blanking interval data application system as defined in  
claim 25 wherein the means for retransmitting said encoded data comprises means  
for displaying said encoded data and wherein the means for receiving the  
30           retransmitted encoded data comprises an alphanumeric keypad.

          49.    A method for data retrieval and use comprising the steps of:  
                  encoding data in a predetermined transmission format;  
                  broadcasting the encoded data as a portion of a television  
35           transmission signal during the vertical blanking interval portion of the signal;  
                  receiving the television signal with a VBI decoder and extracting the  
encoded data from the vertical blanking interval;

-21-

1 retransmitting the encoded data;  
receiving the retransmitted encoded data in a portable data coupon;  
storing the received data in the portable data coupon;  
selectively decoding and displaying the data present in the portable  
5 data coupon; and  
selectively transmitting the encoded data from the portable data  
coupon to a receiving apparatus.

10 50. A method for data retrieval and use as defined in claim 49 further  
comprising the step of intermediately storing the encoded data in a memory prior to  
retransmission.

15 51. A method for data retrieval and use as defined in claim 49 wherein  
the step of receiving the television transmission signal includes the step of  
identifying the encoded data according to predetermined categories and wherein the  
step of retransmitting the encoded data includes the step of formatting the encoded  
data for retransmission corresponding to the category of the data.

20 52. A method for data retrieval and use as defined in claim 51 wherein  
receiving the retransmitted encoded data in the portable data coupon includes the  
step of identifying the data category and wherein storing the received data in the  
portable data coupon includes the steps of selecting data for storage based on the  
categories identified and storing said selected data.

25 53. A method for data retrieval and use as defined in claim 49 wherein  
the step of storing the data in the portable data coupon comprises the step of storing  
the encoded data in a temporary storage location in the portable data coupon and  
further comprising the step of selecting encoded data from temporary storage for  
protected storage.

30 54. A method for data retrieval and use as defined in claim 53 wherein  
the step of storing the encoded data in temporary storage further includes the steps  
of:

35 determining when all temporary storage locations are full;  
determining which temporary storage location contains the oldest  
data; and

-22-

1 storing newly received data in the storage location having the oldest  
data.

5 55. A method for data retrieval and use as defined in claim 45 wherein  
the step of selectively transmitting the encoded data to a receiving apparatus further  
comprises the step of transmitting a unique identification of the portable data coupon  
to the receiving apparatus.

10 56. A method for data retrieval and use as defined in claim 49 further  
comprising the step of:  
deleting data stored in the portable data coupon after selectively  
transmitting the data to a receiving apparatus.

15 57. A method for data retrieval and use as defined in claim 49 wherein  
selectively transmitting the encoded data from the portable data coupon to a  
receiving apparatus comprises the steps of:

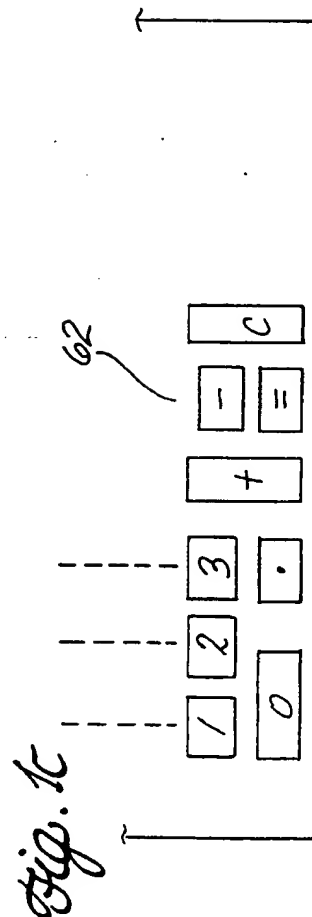
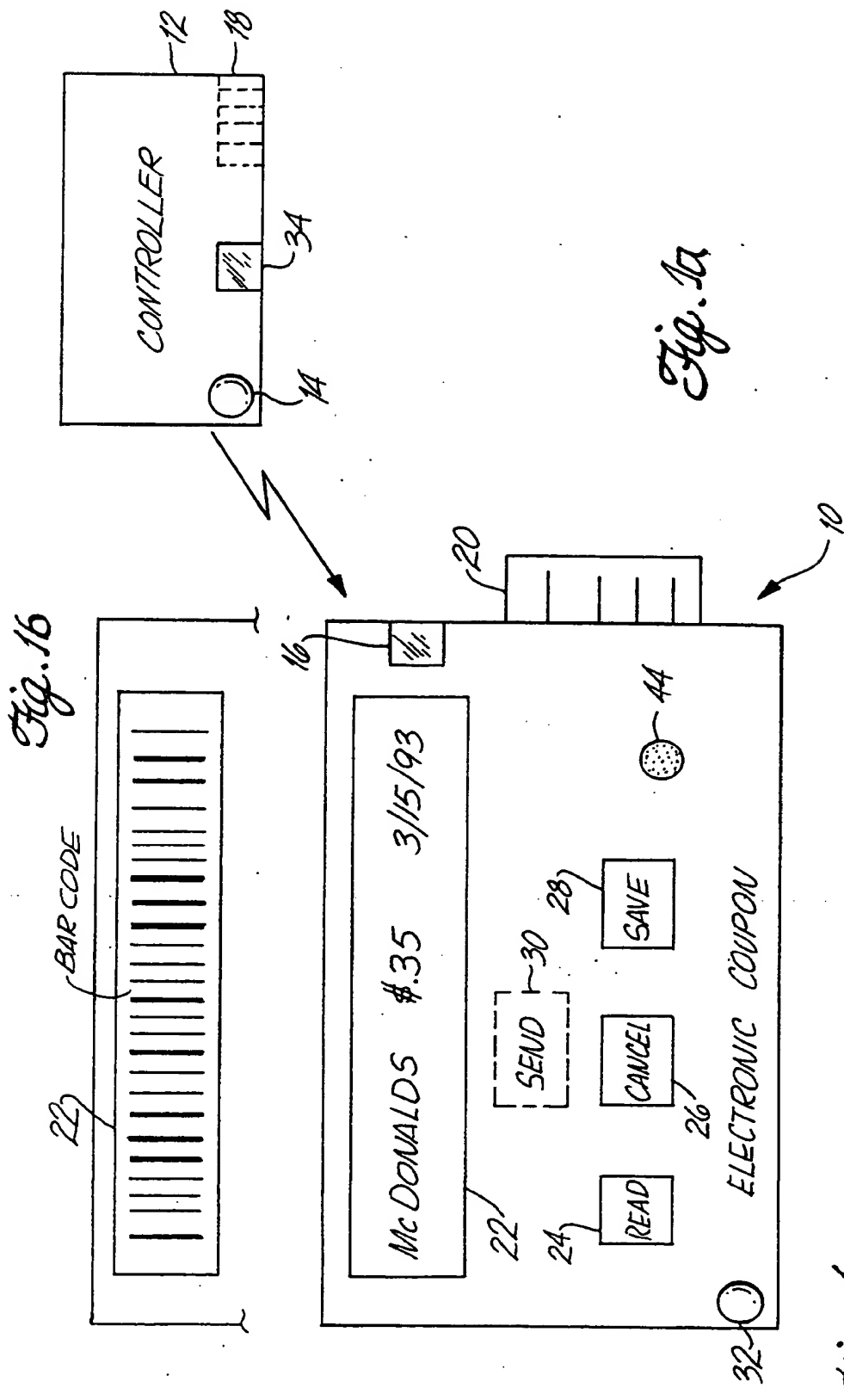
20 querying the portable data coupon to determine if encoded data  
corresponding to desired data is present in a storage location; and  
transmitting the data from the storage location of the portable data  
coupon.

58. A method for data retrieval and use as defined in claim 57 wherein  
the steps of querying and retrieving are repeated for all desired data.

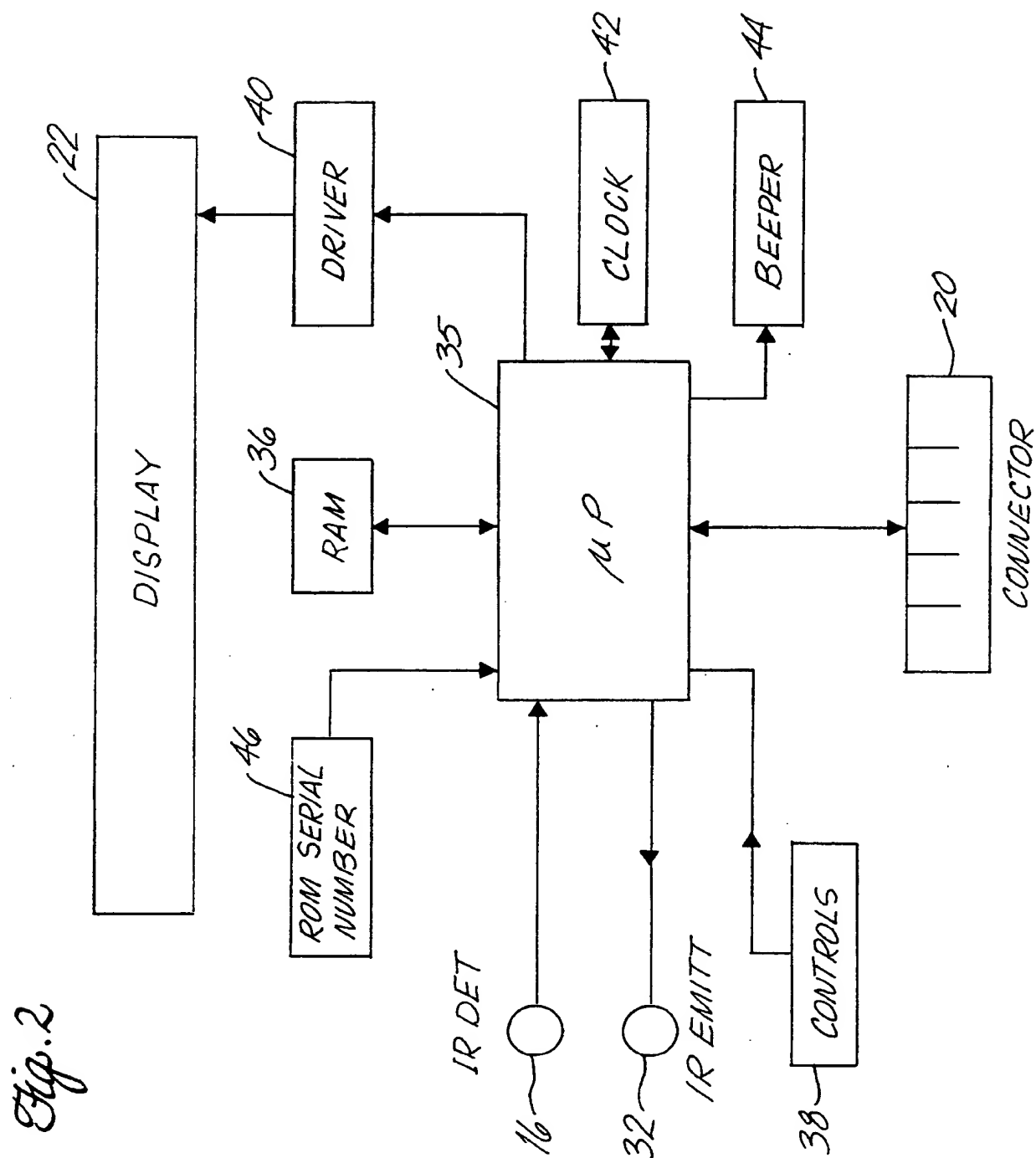
25 59. A method for data retrieval and use as defined in claim 57 further  
comprising the step of deleting data which has been transmitted from storage.

30

35



2/6



3/6

Fig. 3

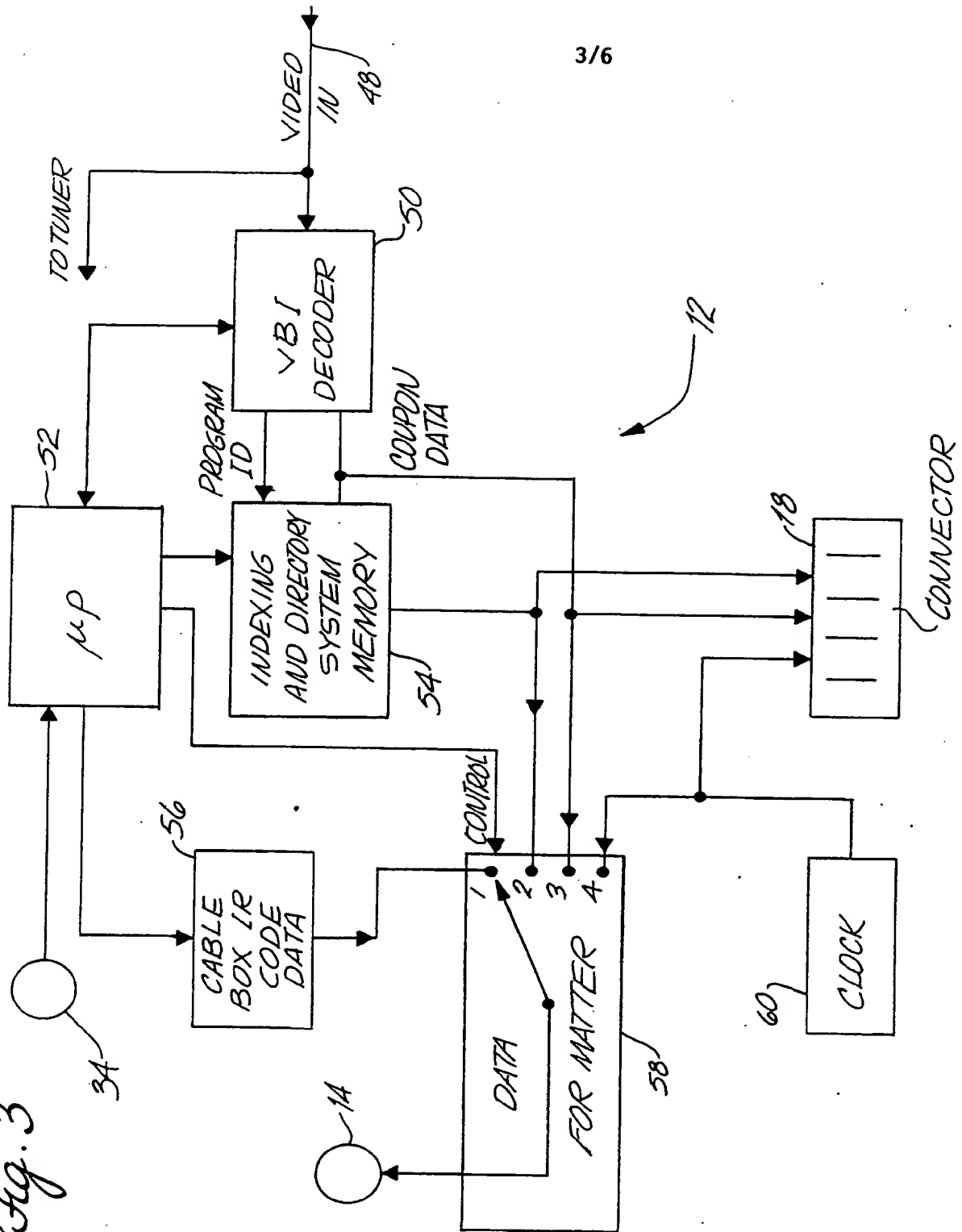
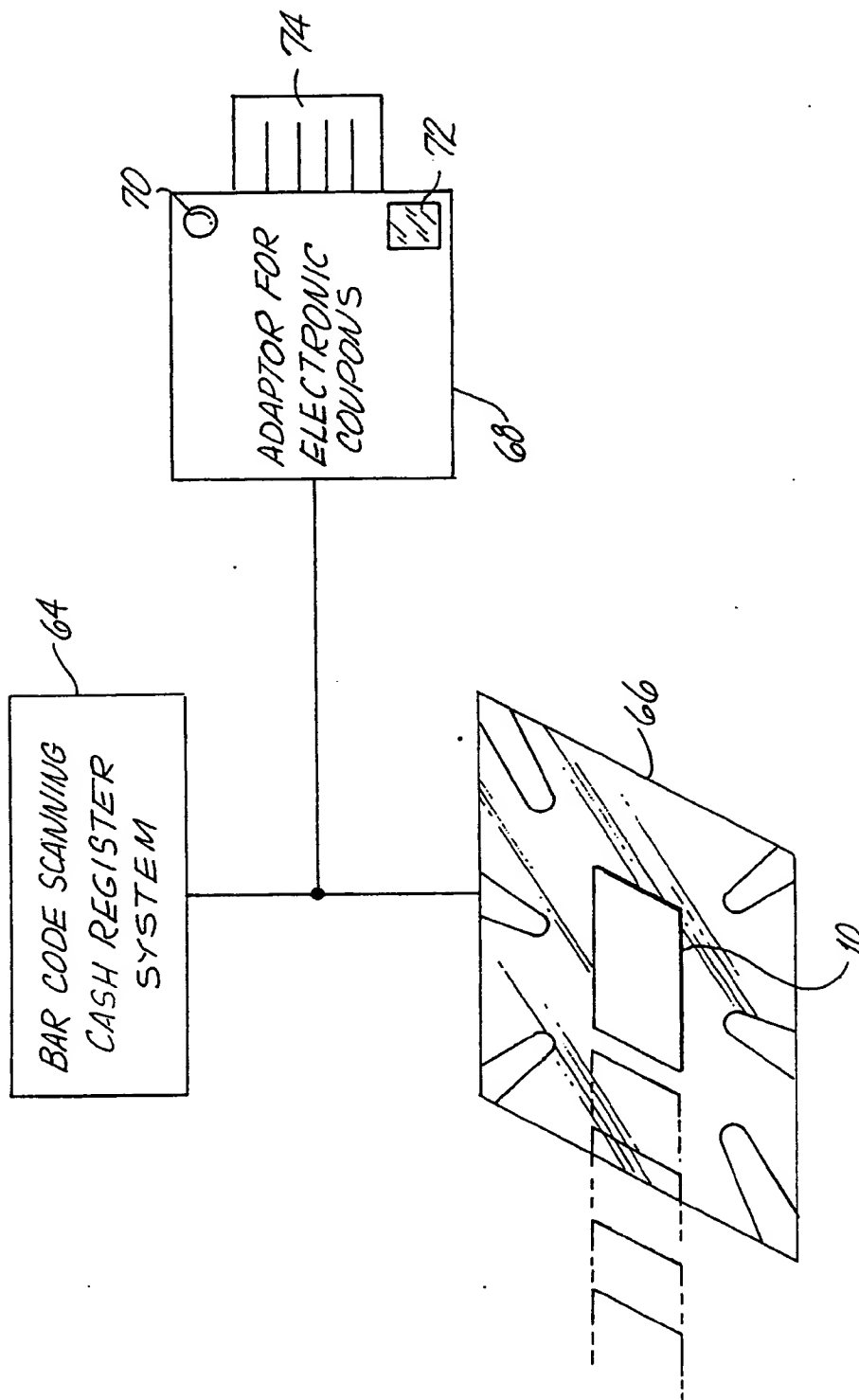
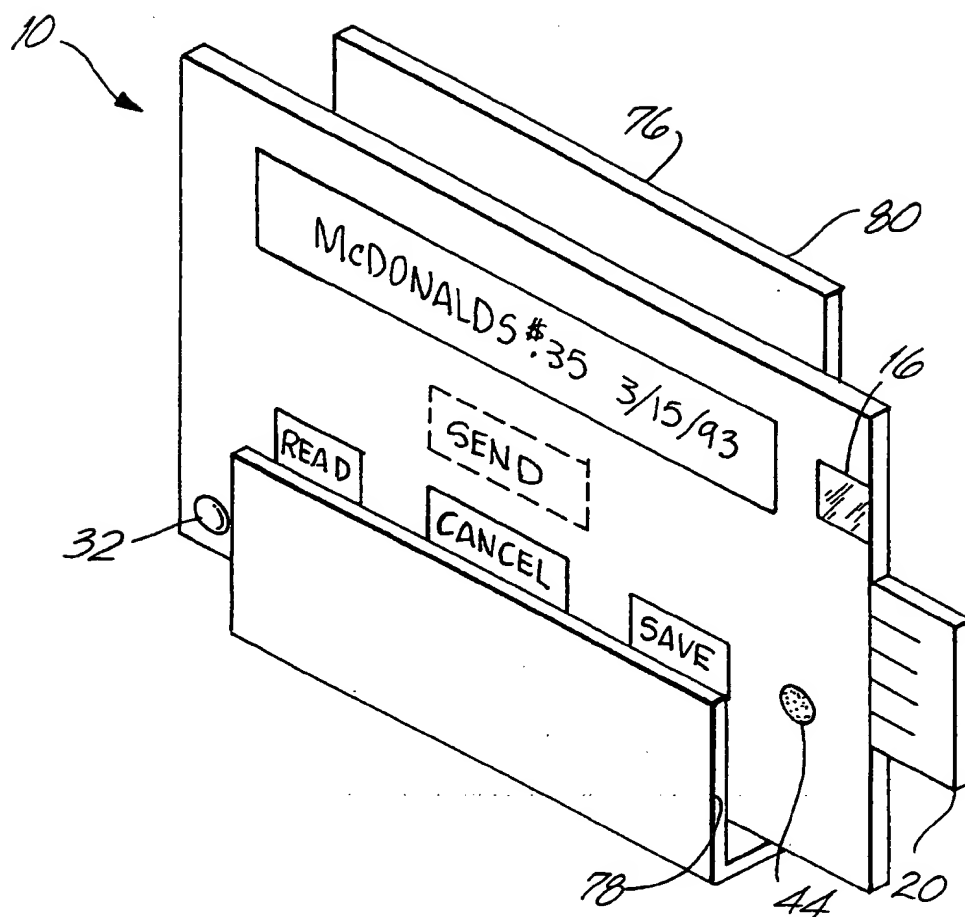


Fig. 4



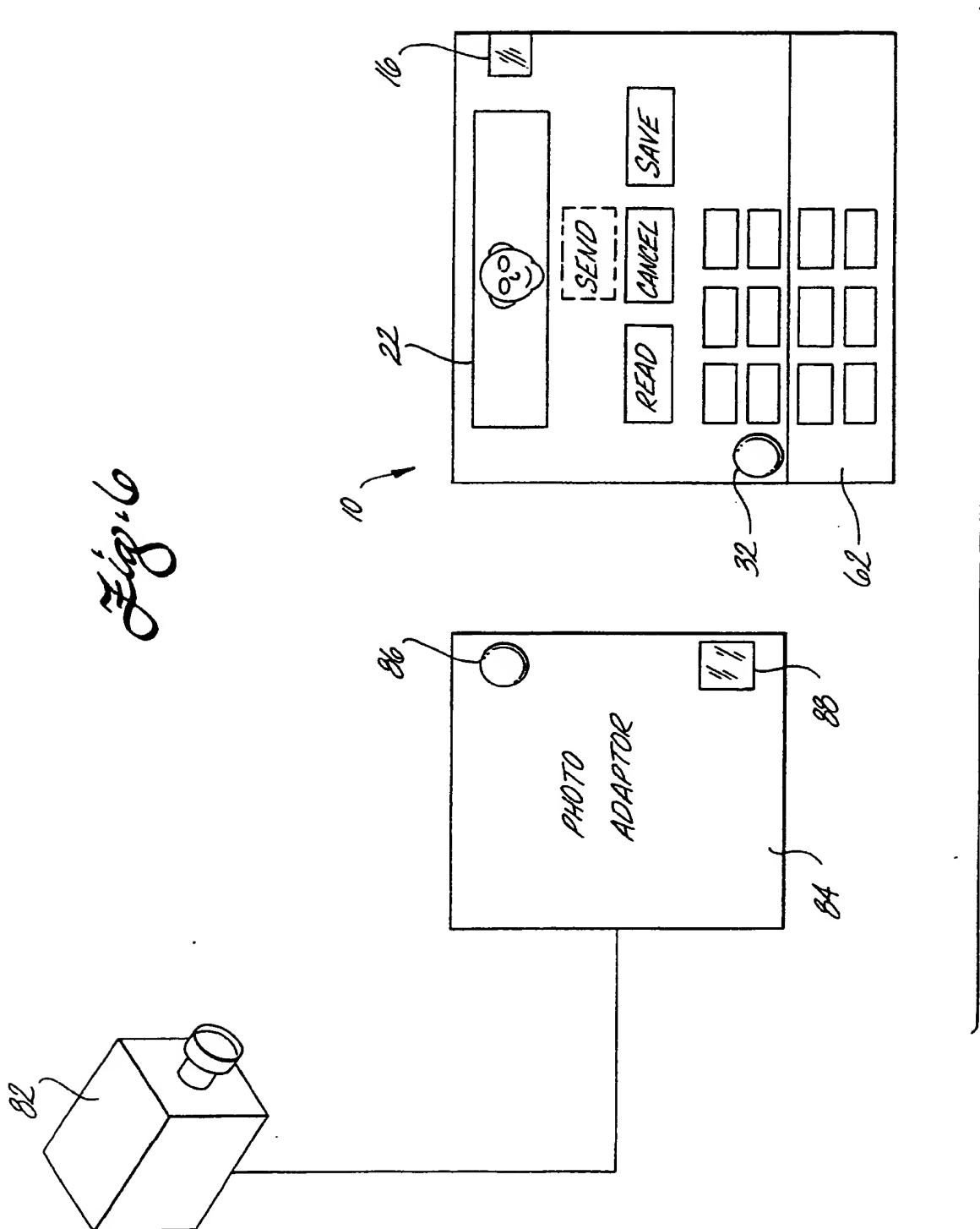
5/6

Fig. 5



6/6

Fig. 6



## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US94/03891**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(5) :H04N 7/087, 7/16

US CL :348/460, 461, 478, 3; 235/380

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : Please See Extra Sheet.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

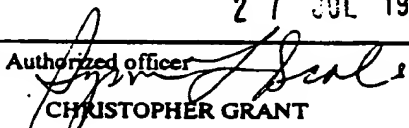
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 3,848,082 (SUMMERS) 24 NOVEMBER 1974 figure 2, col. 4, lines 25-27, col.7, lines 15-16	1, 6, 9
X	US, A, 5,192,854 (COUNTS) 09 MARCH 1993 figures 1 and 2, col. 3, lines 48-50, col. 4, lines 6-10 col. 3, lines 34-39, col. 3, lines 65-67	1-4, 6, 9-11, 14,16
X,P	US, A, 5,287,181 (HOLMAN) 15 FEBRUARY 1994 figure 1, col. 6, lines 16-20, 54-60, col. 7, lines 52-61 figure 6, col. 3, lines 15-27, figure 5,	1-3, 6 9-11

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* "A"	Special categories of cited documents: document defining the general state of the art which is not considered to be part of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier document published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"A" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 09 JUNE 1994	Date of mailing of the international search report 27 JUL 1994
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer  CHRISTOPHER GRANT Telephone No. (703) 305-4755

Form PCT/ISA/210 (second sheet)(July 1992)\*

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US94/03891

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US, A, 5,249,044 (VON KOHORN) 28 SEPTEMBER 1993, figures 2 and 6, col. 12, lines 39-51, col. 10, lines 27-29, col. 8, lines 5-18, col. 4, lines 15-51, 65-69, col. 5, lines 1-6.	1, 3, 6 9, 10
A	US, A, 5,070,404 (BULLOCK et al.) 03 DECEMBER 1991, figure 3	1-21
A	US, A, 5,057,915 (VON KOHORN) 15 OCTOBER 1991, figure 8	1-21
A,P	US, A, 5,294,782 (KUMAR) 15 MARCH 1994 figure 1	1-21
A,P	US, A, 5,282,249 (COHEN et al.) 25 JANUARY 1994, figs. 1-5	1-21
A	US, A, 5,276,311 ((HENNIGE) 04 JANUARY 1994 figure 1	1-21
A	US,A, 5,189,287 (PARIENTI) 23 FEBRUARY 1993 figure 1	1-21

Form PCT/ISA/210 (continuation of second sheet)(July 1992)\*

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US94/03891

## B. FIELDS SEARCHED

Minimum documentation searched

Classification System: U.S.

348/478,473, 460,461,1,3,12,13; 358/84,86,147; 455/2,4.2,5.1; 235/380,381,383  
H04N 7/16; 7/087

**THIS PAGE BLANK (USPTO)**